

RECLOSABLE PLASTICS PACKAGING WITH TWO HALF-SHELLS AND  
PROCESS FOR PRODUCING THIS PACKAGING

The present invention relates to packaging made from a  
5 thermally and/or mechanically deformable plastics film with  
two half-shells, which may be joined together, preferably  
reclosably, in a heat-sealing plane and so form a hollow  
article and in which the heat-sealing plane is inclined  
relative to the horizontal, wherein, in the area of the  
10 hollow article, the heat-sealing plane extends  
substantially along the diagonal of the hollow article. The  
present application moreover relates to a process for the  
production of packaging with an inclined heat-sealing plane  
and the filling thereof.

15 Packaged goods, in particular foodstuffs, are today ever  
more frequently offered for sale to the consumer for  
consumption in plastics packaging. Often, however, such  
packaging exhibits the disadvantage that the packaged  
20 product cannot readily be taken out once the lidding film  
has been removed.

The object of the present invention is accordingly to  
provide packaging which does not exhibit the disadvantages  
25 of the prior art and which is straightforward to produce  
and fill.

This object is achieved according to the invention by the  
provision of packaging made from a thermally and/or  
30 mechanically deformable plastics film with two half-shells,  
which may be joined together, preferably reclosably, in a  
heat-sealing plane and so form a hollow article and in  
which the heat-sealing plane is inclined relative to the

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horizontal, wherein, in the area of the hollow article, the heat-sealing plane extends substantially along the diagonal of the hollow article.

- 5 The packaging may have any desired cross-section, but is preferably round, rectangular or square.

In a preferred embodiment, the packaging according to the invention comprises between the first and the second half-shell at least one hinge with which the packaging may be  
10 opened and closed. The two half-shells and the hinge are preferably shaped from the same film. The person skilled in the art will recognise that the two half-shells and the hinge may also consist of in each case different films or  
15 that the two half-shells and the hinge may be constructed from different films. The hinge is preferably arranged in the vicinity of the highest point of the packaging.

In a preferred embodiment of the packaging according to the invention, both half-shells in each case comprise, on the  
20 longitudinal side thereof opposite the hinge, a tab arranged centrally on the heat-sealing surface. These two tabs make it easier for the user to open the packaging for the first time and, once it has first been opened, to open  
25 and close the two half-shells.

The packaging according to the invention may moreover be reclosable. To this end, flexible, sealing lips which are shaped complementarily to one another are preferably  
30 provided on the heat-sealing surface adjacent both half-shells, said sealing lips engaging in on another on application of mechanical pressure. Hook and loop fasteners of any desired shape or projections and recesses

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complementary thereto are likewise preferably provided for this purpose on the heat-sealing surfaces.

5 In one particularly preferred embodiment, the recesses take the form of an elongate hole and particularly preferably comprise scores in the peripheral zone.

10 The projections are preferably constructed such that they comprise embossed portions in the lower zone which additionally stiffen said zone.

The packaging according to the invention furthermore preferably comprises lateral guide ribs which are, for example, designed according to the tongue and groove  
15 principle. These guide ribs ensure that the lid sits better on the shell after reclosing. The guide ribs furthermore also perform a certain sealing function.

20 The half-shells furthermore preferably comprise stiffening ribs to simplify filling of the packaging and to improve protection for the packaged goods.

25 The packaging according to the invention is in particular suitable for packaging sliced sausage and/or cheese which has been cut into slices and stacked or chunks of sausage or cheese. The products to be packaged may be of any desired cross-section, but they are preferably round, triangular or rectangular.

30 The packaging according to the invention has the advantage that the contents located therein may easily be removed. The packaging is moreover simple and straightforward to produce and very easy to fill.

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The present invention also provides a process for the production of packaging from a thermally and/or mechanically deformable plastics film with two half-shells, which may be joined together, preferably reclosably, in a heat-sealing plane, wherein the heat-sealing plane is inclined relative to the horizontal and, during thermoforming, heat-sealing or cutting the machine plane corresponds to the heat-sealing plane of the half-shells.

The heat-sealing plane preferably extends along the hollow article which is formed by the two half-shells.

The half-shells are preferably thermoformed from a lower film and an upper film.

Once the packaging has been filled, the lower film and the upper film are furthermore preferably brought together in the heat-sealing plane and held together with holding down means before heat-sealing.

This process according to the invention permits particularly straightforward production of the packaging according to the invention.

The present invention also provides a process for filling with a product packaging made from a thermally and/or mechanically deformable plastics film with two half-shells, which may be joined together, preferably reclosably, in a heat-sealing plane, wherein the heat-sealing plane is inclined relative to the horizontal and, during filling, the machine plane corresponds to the heat-sealing plane of the half-shells.

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For the purposes of the invention, the product may be any product known to the person skilled in the art which is packaged. Preferably, however, the product is a foodstuff,  
5 in particular sausage or cheese, which may be in slices or as a chunk, i.e. in one piece.

During the filling operation, the product is preferably guided against at least parts of the wall of the lower  
10 half-shell and/or aligned therewith.

The product particularly preferably slides during filling along at least parts of the wall of the lower half-shell and is so guided and optionally aligned in such a manner  
15 that the fit of the wall of the lower half-shell with the introduced product is improved.

In a further preferred embodiment of the process according to the invention, the product is pressed during filling  
20 against at least parts of the wall of a half-shell and is so guided and aligned in such a manner the fit of the wall of the lower half-shell with the introduced product is improved.

25 Likewise preferably, the product is pressed after filling against at least parts of the wall of the half-shell and is so aligned, such that any irregular stacking of the product in the half-shell is at least partially eliminated. This preferred embodiment of the process according to the  
30 invention is in particular suitable for at least partially frozen foodstuffs.

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In another preferred embodiment of the present invention, prior to filling the half-shell, the product is gauged with gauging means in such a manner that it exhibits an at least virtually uniform cross-section. During the filling  
5 operation, the product is guided against at least parts of the wall a half-shell and/or optionally aligned therewith in such a manner that the fit of the wall of the lower half-shell with the introduced product is improved.

10 The filling process according to the invention has the advantage that it is particularly straightforward and cost-effective to carry out and that it makes it possible to package stacks of sliced foodstuffs in such a manner that the stack has a uniform cross-section in the packaging and  
15 it is accordingly straightforwardly possible to place the complementary lid onto the filled half-shell.

The invention is explained with reference to **Figures 1 to 9** below. These explanations are given merely by way of  
20 example and do not restrict the general concept of the invention.

**Figure 1** shows the packaging according to the invention.

25 **Figure 2** shows the opened packaging according to the invention filled with slices of sausage.

**Figures 2a and b** show the packaging according to the invention with lateral guide ribs.

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**Figures 2c to e** recesses and projections for closing the packaging.

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**Figure 3** shows the packaging according to the invention relative to the machine plane.

5 **Figure 4** shows the placement of sliced foodstuffs in the packaging with a placement tongue.

**Figure 5** shows the placement of stacked, sliced foodstuffs in the packaging with a retractable placement tongue.

10 **Figure 6** shows the placement of sliced, stacked foodstuffs with a placement tongue and subsequent pressing of the placed stack to align it.

15 **Figure 7** shows a further embodiment of the filling according to Figure 5.

**Figure 8** shows filling of the packaging, in which the sliced and stacked product is gauged to a uniform cross-section prior to filling.

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**Figure 9** shows closing of the filled packaging.

25 **Figure 1** shows the packaging 1 according to the invention, which comprises two half-shells 2, 3. The two half-shells are reclosably joined together in the heat-sealing plane 4 and so form a hollow article. As can clearly be seen, the heat-sealing plane 4 extends substantially along the diagonal of the hollow article and is accordingly inclined relative to the horizontal. It can moreover be seen that  
30 both the half-shells 2, 3 respectively have a wall 19 or 16, each being of a variable height along the periphery of the half-shell. The walls 19, 16 are in each case stiffened by the ribs 11, such that the product is better protected

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and the half-shells may more readily be filled with product.

**Figure 2** likewise shows the packaging 1 according to the invention, which in the present case is filled with slices of sliced sausage 9. The packaging has two half-shells 2, 3, which may be joined together reclosably in the heat-sealing plane 4. The two half-shells are joined to one another via the hinge 5. Initial opening and subsequent opening and closing of the packaging may be facilitated by the tabs 7 and 8. Reclosability is ensured by the projection 6, which is pressed into the complementary recess (not shown) in tab 8. Thanks to the shape of the packaging, it is straightforwardly possible to take one slice of sausage after another from the stack, without the packaging obstructing removal.

**Figure 2a** shows packaging according to Figures 1 and 2, wherein in the present case the packaging comprises two guide ribs 25, 26 respectively on the right hand and left hand rim of the packaging. The guide ribs 25, 26 are in each case located outside the heat-sealing zone 27. As may be seen in **Figure 2b**, the guide ribs 25, 26 consist of a groove 29 and a tongue 28. The tongue 28 protrudes into the groove 29, so providing a tongue and groove arrangement. **Figure 2b** shows two alternative configurations of the guide ribs 25, 26. The person skilled in the art will recognise that the guide ribs 25, 26 may comprise undercuts in order to improve their joining effectiveness and make them more difficult to separate.

**Figure 2c** shows a reversible closure between the two half-shells, wherein the projection 31 is inserted into the



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recess 30. In the present case, the recess 30 takes the form of an elongate hole. **Figure 2d** shows an embodiment in which the recess comprises slits 33 in the peripheral zone. **Figure 2e** shows the lower part of a projection, in which a cross has been embossed for stiffening purposes.

**Figure 3** shows the heat-sealing plane 4 and the machine plane 10, in which runs the lower film for the production of half-shell 3. It can readily be seen that the heat-sealing plane 4 is congruent with the machine plane 10, such that the packaging may straightforwardly be produced, filled, heat-sealed and/or cut out from the packaging film.

The person skilled in the art will recognise that the two half-shells may be manufactured, filled, optionally joined with one another and/or heat-sealed on a single machine. Because the heat-sealing plane 4 is congruent with the machine plane, these process steps are particularly straightforward to carry out. It is, however, also possible for the lower half-shell 3 to be placed as a tray in the packaging machine and merely filled in the packaging machine and closed and heat-sealed with an upper film preshaped as a half-shell 2.

**Figure 4** shows an embodiment of the process according to the invention for filling the packaging. The half-shells 3, which comprise the package wall 16 and the package bottom 18, move in the machine plane. The person skilled in the art will recognise that the Figure merely shows a section through the half-shell 3 and that the wall extends at least virtually completely around the entire package bottom 18. The half-shells 3 are conveyed cyclically along the machine plane 10 at speed  $v_1$ . The product 9, in the present case

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sliced, stacked sausage, is conveyed with a placement tongue 12 in the direction of the half-shells 3. The inclination of the placement tongue 12 relative to the machine plane ideally matches the inclination of the bottoms 18 relative to the machine plane 10. In the present case, the half-shells 3 are filled during the advance thereof, the speed  $v_2$  of the product being selected such that it at least corresponds to the speed of advance  $v_1$  of the half-shell. As a result, the product 9 slides during filling at least to a certain extent along the wall 16 and is thereby aligned at least in one direction and the stack of sausage, as can be seen on the left hand side of the Figure, is adjusted to a virtually uniform cross-section. If a speed  $v_2$  greater than the speed of advance  $v_1$  is selected, the stack of sausage is pressed during filling against the wall 16, and the stack of sausage is more firmly guided or aligned against the wall 16.

**Figure 5** shows a further embodiment of the filling process according to the invention, wherein in the present case filling proceeds while the half-shell 3 is stationary. In the present case, the half-shells 3 are again filled with the product 9 with a placement tongue, which is, however, retractable in this example (c.f. representation in broken lines), such that the product falls from above into the half-shell 3 and is so guided along and/or aligned with the wall 16. In one embodiment of this example according to the invention, the placement tongue 12 is retracted and the placement belt 20 is so tightened in such a manner that the speed  $v_2$  of the product 9 is zero, such that the stack of sausage falls from above into the half-shell 3 and so slides along the wall 16 and is so guided and/or aligned. In a further preferred embodiment, the placement tongue 12

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is retracted and the belt 20 is so tightened in such a manner that speed  $v_2$  is  $> 0$ , such that, as it is falling downwards, the stack of sausage moves slightly forwards and, while the packaging shell 3 is being filled, is  
5 pressed against the wall 16 and is so guided and/or aligned.

**Figure 6** shows a further embodiment of the filling process according to the invention. The product 9 is filled into  
10 the half-shells 3 as described in **Figure 4** and then pressed with pressing means 21, which move as shown by the double-headed arrow, at least in part against the wall 16 and is so preferably additionally aligned, such that the stack of sausage is of a uniform gauge. The person skilled in the  
15 art will recognise that this kind of alignment is independent of the nature of the actual filling operation and that the means 21 may extend over relatively large zones of the periphery of the product 9.

**Figure 7** shows substantially the packaging process according to Figure 5, except that in the present case the placement tongue 12 projects into the half-shell 3 such that, when the placement tongue 12 is retracted, the product 9 falls from a lower height into the packaging  
25 half-shell 3 than is the case in Figure 5. For this embodiment of the process according to the invention, the half-shell 3 must be shaped in such a manner that the placement tongue 12 may be advanced into the half-shell virtually up to the wall 16. The half-shell is preferably  
30 rectangular or square.

**Figure 8** shows a further embodiment of the filling process according to the invention, in which, before the half-shell

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3 is filled, the stack of sausage 9 is adjusted to a virtually uniform cross-section with gauging means 17. The product then slides either into the packaging half-shell and is so guided and/or aligned against at least parts of the wall 16 or the product is pressed with a plunger 22 into the packaging and is so guided along the wall 16 and optionally aligned. The person skilled in the art will recognise that the gauging device is arranged perpendicularly to the bottom of the packaging half-shell 3.

**Figure 9** shows a process for closing the filled packaging half-shells 3 which have been shaped from the lower film 13. The half-shells 2, which have been shaped from the upper film 14, are brought together in the machine plane with the half-shells 3 and held together by the holding down means 15 before heat-sealing in the heat-sealing station 23. The person skilled in the art will recognise that the point of rotation 24 of the upper film 14 should preferably not be located below the product in the area of the point of rotation.